

PCT

BEST AVAILABLE COPY

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

ANIZATION JUL 31 1998



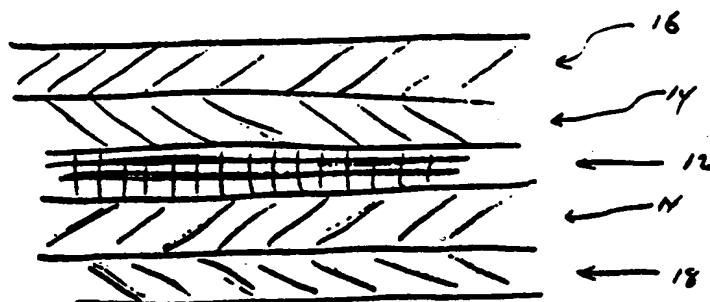
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | | |
|---|--|--|---|
| (51) International Patent Classification 6 : C08L 23/08, 27/00, C08J 5/18, B32B 27/32, B65D 65/40 | | A3 | (11) International Publication Number: WO 98/17469 |
| | | | (43) International Publication Date: 30 April 1998 (30.04.98) |
| (21) International Application Number: PCT/US96/09037 | | (81) Designated States: AU, BR, European patent-(AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). | |
| (22) International Filing Date: 17 June 1996 (17.06.96) | | <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> | |
| (71) Applicant: AMERICAN NATIONAL CAN COMPANY [US/US]; 8770 West Bryn Mawr Avenue, Chicago, IL 60631 (US). | | (88) Date of publication of the international search report: 9 July 1998 (09.07.98) | |
| (72) Inventors: GALLOWAY, Deane, E.; 2517 North Hillwood Court, Appleton, WI 54911 (US). LIND, Keith, D.; 1806 North Englewood, Appleton, WI 54914 (US). KITTEL, Dennis, J.; 542 E. Peckham Road, Neenah, WI 54956 (US). WALBRUN, George, H.; 1047 Ida Street, Menasha, WI 54952 (US). ZHENG, Johnny, Q.; 2118 Clover Lane, Appleton, WI 54956 (US). | | | |
| (74) Agent: BISBIKIS, John, G.; McDermott, Will & Emery, 227 W. Monroe Street, Chicago, IL 60606-5096 (US). | | | |

(54) Title: MULTILAYER THERMOPLASTIC FILMS AND PACKAGES MADE THEREFROM

(57) Abstract

A multilayer thermoplastic film, and packages made from the film, comprising a layer of ethylene vinyl alcohol (EVOH) as an oxygen barrier layer (12), a layer of a polymer or copolymer formed by the polymerization reaction with a single site catalyst blended with ethylene vinyl acetate (EVA) as a sealant layer (16, 18), said film having improved sealability and improved clarity compared to conventional films.



BEST AVAILABLE COPY

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

| | | | | | | | |
|----|--------------------------|----|---------------------------------------|----|---|----|--------------------------|
| AL | Albania | ES | Spain | LS | Lesotho | SI | Slovenia |
| AM | Armenia | FI | Finland | LT | Lithuania | SK | Slovakia |
| AT | Austria | FR | France | LU | Luxembourg | SN | Senegal |
| AU | Australia | GA | Gabon | LV | Latvia | SZ | Swaziland |
| AZ | Azerbaijan | GB | United Kingdom | MC | Monaco | TD | Chad |
| BA | Bosnia and Herzegovina | GE | Georgia | MD | Republic of Moldova | TG | Togo |
| BB | Barbados | GH | Ghana | MG | Madagascar | TJ | Tajikistan |
| BE | Belgium | GN | Guinea | MK | The former Yugoslav Republic of Macedonia | TM | Turkmenistan |
| BF | Burkina Faso | GR | Greece | ML | Mali | TR | Turkey |
| BG | Bulgaria | HU | Hungary | MN | Mongolia | TT | Trinidad and Tobago |
| BJ | Benin | IE | Ireland | MR | Mauritania | UA | Ukraine |
| BR | Brazil | IL | Israel | MW | Malawi | UG | Uganda |
| BY | Belarus | IS | Iceland | MX | Mexico | US | United States of America |
| CA | Canada | IT | Italy | NE | Niger | UZ | Uzbekistan |
| CF | Central African Republic | JP | Japan | NL | Netherlands | VN | Viet Nam |
| CG | Congo | KE | Kenya | NO | Norway | YU | Yugoslavia |
| CH | Switzerland | KG | Kyrgyzstan | NZ | New Zealand | ZW | Zimbabwe |
| CI | Côte d'Ivoire | KP | Democratic People's Republic of Korea | PL | Poland | | |
| CM | Cameroon | KR | Republic of Korea | PT | Portugal | | |
| CN | China | KZ | Kazakhstan | RO | Romania | | |
| CU | Cuba | LC | Saint Lucia | RU | Russian Federation | | |
| CZ | Czech Republic | LI | Liechtenstein | SD | Sudan | | |
| DE | Germany | LK | Sri Lanka | SE | Sweden | | |
| DK | Denmark | LR | Liberia | SG | Singapore | | |

INTERNAL SEARCH REPORT

International Application No

PCT/US 96/09037

BEST AVAILABLE COPY

| A. CLASSIFICATION OF SUBJECT MATTER IPC 6 C08L23/08 C08L27/00 C08J5/18 B32B27/32 B65D65/40 | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|----------|--|-----------------------|---|---|----------------------------|---|---|------|---|---|---------------|---|--|----------------------------|---|--|----------------------|--|--|-----|
| According to International Patent Classification(IPC) or to both national classification and IPC | | | | | | | | | | | | | | | | | | | | | | | | | |
| B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 6 C08L C08J B32B B65D | | | | | | | | | | | | | | | | | | | | | | | | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electronic data base consulted during the international search (name of data base and, where practical, search terms used) | | | | | | | | | | | | | | | | | | | | | | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Category</th> <th style="text-align: left; padding: 2px;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="text-align: left; padding: 2px;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">WO 95 00333 A (AMERICAN NATIONAL CAN CO) 5 January 1995</td> <td style="padding: 2px;">1,2, 11-13, 17,18,21</td> </tr> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">see claims 1-3,7,9,14,17,22,23,25 see claims 28,34,76,78,80,82-96 ---</td> <td style="padding: 2px;">1-21</td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">US 5 397 613 A (GEORGELOS PAUL N) 14 March 1995 see claims 1,8,11-13,17 ---</td> <td style="padding: 2px;">1,2, 11-13</td> </tr> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">EP 0 628 593 A (GRACE W R & CO) 14 December 1994</td> <td style="padding: 2px;">1,2, 11-13, 16-18,21</td> </tr> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">see page 5, line 1-3-30; claims 1,3,11; figure 1 ---</td> <td style="padding: 2px;">3-10,14, 15,19,20</td> </tr> <tr> <td></td> <td></td> <td style="padding: 2px;">-/-</td> </tr> </tbody> </table> | | | | | Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | X | WO 95 00333 A (AMERICAN NATIONAL CAN CO) 5 January 1995 | 1,2, 11-13, 17,18,21 | Y | see claims 1-3,7,9,14,17,22,23,25 see claims 28,34,76,78,80,82-96 --- | 1-21 | X | US 5 397 613 A (GEORGELOS PAUL N) 14 March 1995 see claims 1,8,11-13,17 --- | 1,2, 11-13 | Y | EP 0 628 593 A (GRACE W R & CO) 14 December 1994 | 1,2, 11-13, 16-18,21 | Y | see page 5, line 1-3-30; claims 1,3,11; figure 1 --- | 3-10,14, 15,19,20 | | | -/- |
| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | | | | | | | | | | | | | | | | | | | | | | |
| X | WO 95 00333 A (AMERICAN NATIONAL CAN CO) 5 January 1995 | 1,2, 11-13, 17,18,21 | | | | | | | | | | | | | | | | | | | | | | | |
| Y | see claims 1-3,7,9,14,17,22,23,25 see claims 28,34,76,78,80,82-96 --- | 1-21 | | | | | | | | | | | | | | | | | | | | | | | |
| X | US 5 397 613 A (GEORGELOS PAUL N) 14 March 1995 see claims 1,8,11-13,17 --- | 1,2, 11-13 | | | | | | | | | | | | | | | | | | | | | | | |
| Y | EP 0 628 593 A (GRACE W R & CO) 14 December 1994 | 1,2, 11-13, 16-18,21 | | | | | | | | | | | | | | | | | | | | | | | |
| Y | see page 5, line 1-3-30; claims 1,3,11; figure 1 --- | 3-10,14, 15,19,20 | | | | | | | | | | | | | | | | | | | | | | | |
| | | -/- | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex. | | | | | | | | | | | | | | | | | | | | | | | | | |
| * Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed | | | | | | | | | | | | | | | | | | | | | | | | | |
| "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date of the actual completion of the international search | | Date of mailing of the international search report | | | | | | | | | | | | | | | | | | | | | | | |
| 21 April 1998 | | 19/05/1998 | | | | | | | | | | | | | | | | | | | | | | | |
| Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016 | | Authorized officer Derz, T | | | | | | | | | | | | | | | | | | | | | | | |

INTERNATIONAL SEARCH REPORT

Int'l. Application No

PCT/US 96/09037

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|--|----------------------------|
| X | EP 0 577 432 A (GRACE W R & CO) 5 January 1994 | 3,14 |
| X | see page 4, line 3; claims 1-6,12,13 | 1,2, 11-13,21 |
| | see page 4, line 6-13 - page 5, line 20-21-40 | --- |
| P,X | EP 0 701 897 A (GRACE W R & CO) 20 March 1996 | 1,2, 11-13, 17,18,21 |
| P,X | see page 4, line 37-39 - page 5, line 34-52-55; claims 1,7,8,10-13; figure 1 see page 6, line 10-11-17 - page 6, line 42-45 | 4-10,15, 20 |
| E | US 5 593 747 A (GEORGELOS PAUL N) 14 January 1997 see claims 1,8,9,11-14,19,20,26 | 1,2, 11-13 |
| T | EP 0 810 087 A (KUREHA CHEMICAL IND CO LTD ;KUREHA PLASTICS CO LTD (JP)) 3 December 1997 see page 1, line 10-20-23 - page 2, line 10-29-45; claims 1,2,6,13-15 see page 6, line 37-47-50 | 1,2,6, 11-13,16 |
| T | DATABASE WPI Section Ch, Week 9812 Derwent Publications Ltd., London, GB; Class A17, AN 98-128836 XP002062797 ANONYMOUS: "Oriented metallocene linear low density polyethylene film uses - include replacing nylon used in flexible packaging, as capacitor film and as replacement for uniaxially oriented HDPE films" see abstract & RESEARCH DISCLOSURE, vol. 402, no. 063, 10 October 1997, EMSWORTH, GB, ----- | 1,2,11 |

INTERNAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/09037

| Patent document cited in search report | Publication date | Patent family member(s) | | Publication date |
|--|------------------|--|--|--|
| WO 9500333 A | 05-01-95 | AU 7211894 A EP 0706455 A JP 9502401 T | | 17-01-95 17-04-96 11-03-97 |
| US 5397613 A | 14-03-95 | AU 673081 B AU 6737794 A BR 9402255 A CA 2125999 A EP 0634443 A JP 7309962 A NZ 260964 A US 5399437 A US 5593747 A | | 24-10-96 19-01-95 14-03-95 13-01-95 18-01-95 28-11-95 26-10-95 21-03-95 14-01-97 |
| EP 0628593 A | 14-12-94 | AU 6180794 A BR 9402018 A CA 2113137 A JP 7001680 A NZ 260403 A | | 24-11-94 13-12-94 21-11-94 06-01-95 26-03-96 |
| EP 0577432 A | 05-01-94 | AT 158536 T AU 4167593 A BR 9302748 A CA 2099440 A DE 69314102 D MX 9304005 A CA 2086493 A | | 15-10-97 06-01-94 16-02-94 03-01-94 30-10-97 28-02-94 03-01-94 |
| EP 0701897 A | 20-03-96 | AU 3066695 A BR 9504042 A CA 2158121 A JP 8318604 A NZ 280007 A | | 28-03-96 24-09-96 17-03-96 03-12-96 28-10-96 |
| US 5593747 A | 14-01-97 | US 5399437 A US 5397613 A AU 673081 B AU 6737794 A BR 9402255 A CA 2125999 A | | 21-03-95 14-03-95 24-10-96 19-01-95 14-03-95 13-01-95 |

INTERNAL SEARCH REPORT

Information on patent family members

Int. Application No
PCT/US 96/09037

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|---|----------------------------------|
| US 5593747 A | | EP 0634443 A JP 7309962 A NZ 260964 A | 18-01-95 28-11-95 26-10-95 |
| EP 0810087 A | 03-12-97 | JP 10058581 A | 03-03-98 |